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SC-07410-62	27 Jul 62	29	COMOR-D-60, subj: Review of Overflight Reconnaissance

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TCS-14255-62-KH	10 Dec 62	33	COMOR-D-61/2, subj: Requirements Program for Satellite Photography of Priority Objectives
TCS-13173-62-KH Series B	5 Sept 62	30	COMOR-D-61/1, subj: NPIC Photographic Quality Requirements
TCS-13211-62-KH	20 Aug 62	30	COMOR-D-61, subj : Essential Elements of Information Required From Satellite Reconnaissance

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<u>Control Number</u>	<u>Date</u>	<u>Copy</u>	<u>Document Number and Subject</u>
<div style="border: 1px solid black; width: 100px; height: 20px;"></div>	22 Apr 63	43	COMOR-D-62/1, subj: Distribution of Technical Intelligence Photography
TCS-13815-62-KH	12 Oct 62	32	COMOR-D-62, subj: Requirements for Initial Film and Distribution Schedule for 722 Program

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COMOR-D-61/2

COMOR gen. *54R*

*Comor - post paid consideration of
this paper pending briefing on
priority operational capabilities.*

10 December 1962

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MEMORANDUM FOR: Committee on Overhead Reconnaissance

SUBJECT: Requirements Program for Satellite
Photography of Priority Objectives

1. Attached for consideration of the COMOR is a draft requirements program for satellite photography of highest priority objectives.

2. It will be recalled that COMOR has already transmitted to the (S) NRO "Essential Elements of Information Required From Satellite Reconnaissance," COMOR-D-61, which, along with the National Photographic Interpretation Center's examination of the quality of photography necessary to answer the requirements (COMOR-D-61/1), would give the operator some notion of the photographic capability he should seek to achieve in terms of resolution and scale.

3. The attached paper deals with the subject of the frequency with which COMOR might like to see photographic coverage obtained.

4. This document will be on the COMOR agenda for consideration at the December 13 meeting.

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James Q. Reber
Chairman

Committee on Overhead Reconnaissance

1 Attachment: Subject paper

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13, 14--NSA TCO

15--NRO TCO

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COMOR-D-61/2

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SUBJECT: Requirements Program for Satellite Photography
of Priority Objectives

1. Experience since the inception of the satellite program has furnished a basis for determining the ~~minimum~~ *frequency* *inghered* amount of coverage needed to satisfy most of our highest priority intelligence requirements. *using the present system in operation,* In establishing the intervals at which this coverage should be obtained, the following factors were considered:

- a. The average time lapses permissible in coverage of the various types of targets,
- b. The average optimum time lapses for purposes of comparative coverage, and
- c. The time required to process and interpret the results of a mission to a degree which will permit review of the highest priority objectives and revision or refinement of the target listings and requirements.

COMOR-D-61/2

2. On this basis the following ^{General} reconnaissance schedule is recommended by the COMOR:

- A
- a. ^{Potential} Coverage of all targets at ~~10-day~~ intervals during ^{summer months} March through September, months when daylight and weather conditions are favorable:
 - b. ^{Potential} Coverage of all targets at 15-day intervals during the winter months, when adverse weather conditions and inadequate daylight render missions less productive.

3. The COMOR will continue to review the highest priority targets after each successful mission, taking into consideration the photographic interpretation provided by the NPIC. The results of this systematic re-examination of intelligence objectives will be made available immediately to the member agencies of the COMOR, and the (S) National Reconnaissance Office will be kept apprised of changes in targets as the reconnaissance program progresses.

B ~~It is also recommended~~ that a standby reconnaissance capability be provided for use on call in crisis situations. This satellite system should incorporate a vehicle

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COMOR-D-61/2

The type of targets designated as possible indicates
programmed against ~~the~~ relatively few targets specified in *during the*

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These will be selected, few in number and the plan will be program
in such a manner as to cover a broad and repre-

sentative selection of targets, and as many as possible, during

each day's orbits. This capability should include provision

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for immediate replacement of vehicles fired and a means for

these vehicles taking priority over other firings in the U.S.

satellite schedule.

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COMOR-D-61/2

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 20--C/DMD/NPIC
 21--LS/CIA/PAD(NPIC)
 22--TSO CIA
 23--DDI TCO
 24--OCI TCO
25, 26--OSI TCO
 27--ORR TCO
 28--DDP TCO
 29--DDR TCO
 30--AD/OSA
 31--Intel/OSA
 32--SO/OSA
33-35--C/SRS/DDR

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KEYHOLE SYSTEM ONLY COMOR-D-61/1

Comor

5 September 1962

MEMORANDUM FOR: Committee on Overhead Reconnaissance
SUBJECT: NPIC Photographic Quality Requirements

Attached for the information and reference of the COMOR is a memorandum submitted by NPIC to the D/NRO on the above subject. It will be noted that NPIC utilized the COMOR paper "Essential Elements of Information Required from Satellite Reconnaissance" (COMOR-D-61) in the preparation of its paper.

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James Q. Reber
Chairman
Committee on Overhead Reconnaissance

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Subject papers

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9--OACSI TCO
10--ONI TCO
11, 12--AFCIN TCO
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GROUP 1
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28 August 1962

MEMORANDUM FOR: Director, National Reconnaissance Office

THROUGH: Deputy Director (Research) CIA

SUBJECT: NPIC Photographic Quality Requirements

REFERENCES: (a) Memorandum from Director, National Reconnaissance Office, to Director, NPIC, dtd 15 August 1962; Subject: Photographic Interpretation Resolution Requirements

(b) COMOR-D-61, dtd 20 August 1962; Subject: Essential Elements of Information Required from Satellite Reconnaissance

(c) Intelligence Requirements for Satellite Reconnaissance Systems of which SAMOS is an Example, dtd 5 July 1960 (USIB-D-33.6/8 - SECRET

1. Reference (a) requests NPIC to provide a statement of photographic interpretation criteria for quality required to obtain various levels of information on priority target types designated by COMOR. Reference (b) is a list of targets prepared by COMOR in response to this problem. Reference (c) is an earlier USIB paper which addresses the general problem raised by Reference (a).

2. The problem of evaluating the utility of various levels of photographic quality has been discussed during the past several weeks with NPIC with the various Departments represented here. It has proven to be most elusive. Everyone can talk around the subject at length and in most interesting fashion, but converting this to useful resolution figures for the collector is difficult. Some background caveats are summarized briefly as follows:

a. Ground resolution measured in feet in terms of minimum object dimension recognizable has become a generally accepted reference for relative photographic interpretability. As such, it has many limitations and it should be used with caution. However, because of its convenience and, in the absence of a better single descriptive term, it has been utilized at NPIC for the purposes of this paper.

b. Particularly as resolutions improve, the ability to make precise measurements becomes as critical as ability to recognize in terms of object size. We may be able to recognize an object approximately [] on a side (or less), but sharp edges (high acutance) and accurate camera parameters (both interior and exterior orientation) are essential for measurements to identify detail and describe function.

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c. The utility of a given resolution frequently depends on collateral. We currently can do a lot with ten-foot KH resolution because we had earlier [] TALENT photography and other intelligence information. Obviously, the more dependence to be placed on photography alone, the better the resolution required.

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25X1D d. Possible camouflage and deception practices are cause for concern in establishing resolution goals. Again, increased resolution will help, but this is possibly less [] We have so far been unable to associate a specific resolution figure with a requirement []

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3. With some of the above reservations in mind, various groups within NPIC have attempted to assign resolution figures to targets typical of requirements placed on the NPIC for interpretation. The resolution figures are judgement only, based on "average" conditions and current collateral sources; no attempt has been made to weight targets for value; and no attempt has been made to estimate how requirements might change in the future. As a convenient vehicle for presentation we have taken Reference (b) and assigned resolution figures to each target type listed therein. The results are given in Enclosure 1.

4. As a result of analyses of the type described above and general discussions within NPIC, the following comments, combined with Inclosure 1, are offered at this time (these have not been fully coordinated with the Departments represented at NPIC):

a. The current KH-4 system, when functioning properly, is providing excellent surveillance photography at somewhere around ten-foot ground resolution. It is meeting first priority requirements as defined in Reference (c) and partially meeting second priority requirements. It is providing us with good indicators as to where more detailed and precise sensors are required. Combined with earlier TALENT photography, in some cases it is permitting judgements to be made as to identification of new weapons systems []

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Possibly well over 50 percent

of the volume of current requirements placed on us can be met by KH-4 at its best. (However, this figure is influenced by the fact that requestors partially tailor their requests to the suitability of the materials.)

b. There is an urgent requirement for resolutions in the one to two foot range applied against specific targets for technical intelligence (as opposed to broad-scale surveillance). Particularly in the absence of collateral, we will never be able to answer many requirements until this resolution is achieved. [redacted] will not satisfy all requirements, as evidenced by figures in Enclosure 1. We simply need the best we can conceivably get.

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c. With respect to resolutions [redacted] [redacted], the photo interpreter will always want something better than he currently has on his desk. However, minor incremental improvements at the upper end of the scale are not worthwhile if they are costly or jeopardize the broad surveillance program or the technical intelligence goal. At NPIC we cannot single out in terms of targets any significant

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capabilities in a qualitative sense and which would permit some technical intelligence.

d. The USIB should be requested to review Reference (c) and bring it up to date. This will not meet the immediate problem on a timely basis but should be useful for future reference. We consider that the photographic portion of Reference (c) is an excellent discussion of the problem, basically still applicable today but possibly somewhat general. The experience of two years of KH should permit more definitive guidelines.

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[redacted]
Acting Director

1 Enclosure-
Analysis of COMOR-D-61

ANALYSIS OF COMOR-D-61

COMOR-D-61, 20 August 1962, lists a number of targets which represent essential elements of information for the intelligence community.

A joint NPIC team spent one day going over the target list and assigning to each target an estimated object size resolution figure required to analyze the target so as to provide the desired intelligence. The results of this study are given in Attachment 1 and summarized in Attachment 2.

The following considerations are pertinent to the resolution figures presented in these attachments:

a. The target list is not weighted, contains duplicate types of entries and numerically emphasizes some categories at the expense of others. Hence the actual number or percentage of targets associated with a given resolution does not necessarily reflect the over-all utility or value of that particular resolution.

b. Initially, the team attempted to assign discrete values to each target, but it soon developed that individuals were unable to make judgments on a minor incremental basis. After a general study of the target categories it was agreed that the following resolution values were the most definitive that could be assigned (figures in feet): 10, 5, 2, 1, and less than 1.

c. The 10-foot figure was selected to correspond to current KH-4 products under optimum conditions. Many of the targets could be described with poorer resolution than 10 feet, but it was felt that nothing was to be gained by assigning values below current capabilities. In general, this value (10 feet) adequately covers most surveillance targets.

25X1D d. At the lower end of the scale, judgments are difficult. The team members all had considerable experience with TALENT photography which in their judgment generally equated [redacted] resolution as a yardstick. Since they have limited or no experience with [redacted] resolution or under, these values were relative and were based on object size identification associated with target details for technical intelligence.

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f. In a number of cases the target descriptions were ambiguous or not clear as to translation to photo analysis requirements. Further conferences with intelligence analysts would be required to clarify.

2 Attachments-

- 1 - Resolution Associated with COMOR Targets
- 2 - Summary Sheet

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Enclosure 1 to
TCS-13173-62-KH
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COMOR-D-61

20 August 1962

MEMORANDUM FOR: Committee on Overhead Reconnaissance

SUBJECT: Essential Elements of Information Required
From Satellite Reconnaissance

1. The attached list of the essential elements of information has been prepared by COMOR in response to a request by the Deputy Director (Research), CIA, on behalf of the Director of the National Reconnaissance Office (TS). Through the use of asterisks as indicated the elements are identified as pertinent to surveillance or to technical intelligence.

2. This document will be examined by the National Photographic Interpretation Center for the purpose of defining the technical parameters which would affect the selection of photographic sensors to permit the necessary photo interpretation.

3. This is distributed to the Committee for information and reference and will be made available to the DDR/CIA for transmittal to the D/NRO (TS).



James Q. Reber
Chairman

Committee on Overhead Reconnaissance

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Subject Papers

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19--TSO CIA
20--DDI(P) TCO
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